

Two Quantities, One Relationship

Name: _____

Date: _____

Compare methods. Three tickets cost \$12. Six tickets cost \$24 by doubling both quantities, or by finding \$4 per ticket and multiplying by 6. Both preserve the same rate.

Explore and explain

1. A recipe uses 3 cups concentrate to 4 cups water. Find the water needed for 9 cups concentrate. Show scaling and a unit-rate method.

2. Complete: concentrate:water is 3 : 4, while concentrate:total is 3 : $\square$. Explain the difference.

3. A student changes 3 : 4 to 6 : 7. Explain why this does not preserve the recipe and repair it.

Apply and transfer

4. Five notebooks cost \$7.50 at a constant rate. Find the price per notebook and the price of 8 notebooks.
5. A mixture uses 2 cups concentrate to 3 cups water. Find both amounts needed for 35 cups of mixture.
6. Nine students are 30% of a club. How many members are in the club? Show a diagram, equivalent ratios, or an equation.

Think Like a Mathematician

Optional extension. Choose a strategy and justify why it works. Try a diagram, organized cases, a simpler example, or an equation.

7. A recipe begins with red and blue beads in a ratio of $2 : 5$. Adding 9 red beads changes the ratio to $5 : 5$. Find the original number of each color. Show why your answer is unique.

8. Two shops sell identical pencils. Shop A sells 4 for \$3. Shop B sells 6 for \$4.20. Which offers the lower unit price? With \$12, buying only complete packs from one shop, which shop lets you buy more pencils? Explain why unit price alone does not settle the second question.